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CASE REPORT

Facial prosthesis fabricated from dental material for an exposed reconstruction plate: A clinical report

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ABSTRACT

Facial prostheses are often fabricated for cosmetic and psychological reasons for patients with facial defects after tumor resection. Each case is unique, and fabricating a facial prosthesis that is tailored to the individual patient requires use of specific materials and a degree of flexibility. This article describes a facial prosthesis that was made using an Adams clasp and acrylic resin for an elderly patient with metal exposure after mandibulectomy. (*Int J Maxillofac Prosthetics 2022;5:10-12)*

Keywords

Facial prosthesis, acrylic resin, metal exposure.

AUDIOABSTRACT

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INTRODUCTION

Mandibular defects can be caused by tumor resection, trauma, inflammation, and congenital conditions and lead to severe facial deformity and chewing, language, swallowing, breathing, and other functional disorders, with can substantially affect quality of life.[1-3] A plate is often used for reconstruction of the mandible after tumor surgery. However, a common complication is exposure of the plate.[4] A facial prosthesis is often fabricated from silicone rubber for such patients, but is difficult to modify and cannot be adjusted. Furthermore, retaining a prosthesis on movable tissue is a challenge. In this report, we describe a facial prosthesis that was fabricated for a patient with an exposed reconstruction plate by using a dental clasp and acrylic resin that provided adequate retention and could be adjusted.

CASE REPORT

The patient was a 90-year-old woman who presented to the Department of Maxillofacial Prosthetics at Tokyo Medical and Dental University with a major facial defect after left mandibulectomy and reconstruction surgery using a titanium reconstruction plate for squamous cell carcinoma in the left mandibular gingiva. One month after the surgery, 13 cm of the plate was exposed (Fig 1). Further surgery was not indicated because of her age and the risk of complications.

The plan was to correct the defect as far as possible using an acrylic prosthesis that could be attached to the exposed plate using a clasp. A facial impression was taken using irreversible hydrocolloid impression material (Algiace Z; Sankin Kogyo, Tokyo, Japan) and dental stone (Xanthano; Bayer Dental, Leverkusen, Germany). A working cast was made using type 4 dental stone (New Plastone II; GC Corporation, Tokyo, Japan). The retentive component was created using an Adams clasp that was bent to fit the holes of the plate (Fig 2). The facial component was made by mixing self-curing acrylic resin (Unifast III; GC Corporation, Tokyo, Japan) of three different shades (pink, A3, and clear) (Fig 3). Next, the retentive and facial components were tried and fitted. The two components were then connected using Unifast III acrylic resin. Extrinsic coloration (Extrinsic Color; Factor II, Inc., Lakeside, AZ, USA) was then performed. The prosthesis could be adjusted by cutting or adding acrylic resin according to the degree of inflammation of the surrounding tissue

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or if further areas of the metal plate became exposed. Figure 4 shows the patient's facial appearance using the prosthesis.

The color of the dental materials used matched the patient's skin color. The facial component was adjusted regularly to avoid irritation of the surrounding tissue. The facial prosthesis was stable, easy to wear, and could be cleaned by the patient without assistance. Furthermore, she felt able to go out in public when wearing the prosthesis, for example to a restaurant with friends, without worrying about her appearance.

Fig 1. Frontal view of the patient's face (A) and the exposed titanium plate (B).

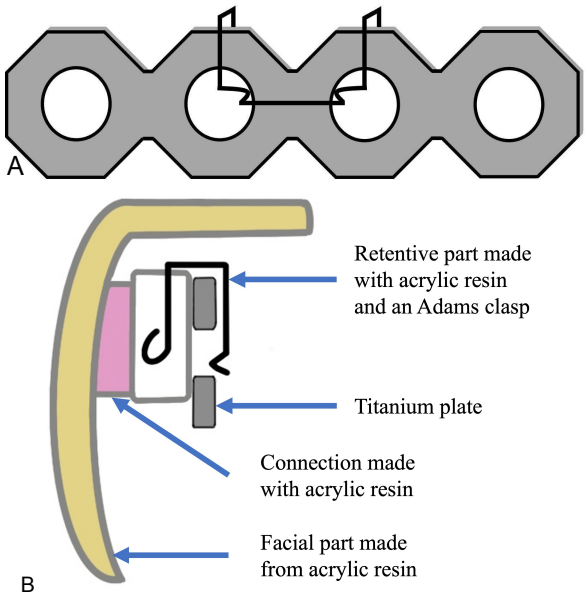
A
Retentive part made with acrylic resin and an Adams clasp
Titanium plate
Connection made with acrylic resin
Facial part made from acrylic resin
B

Fig 2. Preparation of the Adams clasp to fit the titanium plate (A) and a sagittal view of the prosthesis (B).

Fig 3. Dental acrylic resin used for the facial part of the prosthesis.

DISCUSSION

Acrylic resin was used for the prosthesis in this case to overcome the limitations of using silicone rubber. Despite the malleability, color stability, and skin-like texture that makes silicone rubber a common choice for facial prostheses,[5] combining a metal-based attachment with a facial prosthesis made of silicone can lead to several problems. Over time, if the margin does not fit, the prosthesis often needs to be refabricated when silicone rubber is used. It is instead easier to combine a prosthesis made of acrylic resin with a metal attachment. Furthermore, prosthodontists can use acrylic resin to fill the space between the prosthesis and skin. In our case, the exposure of the metal frame was irreversible, and the margin of the prosthesis was expected to need frequent adjustment. The decision to

use acrylic resin was made because the prosthodontist would likely be able to perform frequent adjustments, including adding material to the margin as needed. Because acrylic resin is a hard material, a thin layer can be shaped,[6] making it possible to avoid contact with an irritated and painful area. Another advantage is that acrylic resin is easy to keep clean.[7] The challenge when using acrylic resin is color matching to the skin.[8] In our patient, the mixture of ivory and pink with some extrinsic coloration produced a perfect match to her skin. For patients with darker skin, intrinsic color would be used.

An Adams clasp was selected as the retainer for the prosthesis in this case. Another option would have been to attach the prosthesis to the skin using an adhesive.[9] In our patient, it was necessary to avoid direct contact between the prosthesis and the outside skin tissue, which was very sensitive. Furthermore, given that the metal exposure was not reversible, a misfit with the margin was predicted. Therefore, the margin of the prosthesis was set off the margin of the defect, and the clasp was used to retain the prosthesis, providing a stable retentive force even after using and adjusting the prosthesis.

Fig 4. Frontal view of the patient's face after fitting the prosthesis.

In this patient, whose advanced age precluded reconstructive surgery, use of a prosthesis restored her appearance and made it possible for her to maintain a social life. This case demonstrates that prosthetic treatment is a viable option for managing metal exposure and potentially other complications after head and neck surgery.

CONCLUSION

A facial prosthesis consisting of a dental clasp and acrylic resin to cover an exposed reconstruction plate after mandibulectomy was effective for the aesthetic rehabilitation in an elderly patient.

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